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ABSTRACT

Early onset of at-risk behaviors has been recognized as an important predictor of severity of negative outcomes during adolescence, but little is known about rural children's involvement in such behaviors and related variables. In two rural Midwest counties with high concentrations of child poverty, a survey of 162 predominantly Caucasian fifth- and sixth-graders examined levels of delinquency, substance use, and depression, as well as variables related to risk or protective factors. Findings indicate that a substantial subset of these children were experimenting with drugs, alcohol, or delinquency or were struggling with depression. Although the three risk categories were correlated, different variables were related to each. Delinquency was related to poverty, being male, and depression. Substance use was related to separating from parents, doing poorly in school, movement toward deviant behavior, and peer attachment. Several factors were related to depression, including identity development, poverty, autonomy, and grades. Boys and girls did not differ in the incidence of substance use or depression, but did differ as to predictor variables. Boys were more affected by economic hardship, while girls were influenced by internal factors such as identity development. Although the six school districts surveyed were within 30 miles of each other in a seemingly homogeneous rural context, the incidence of the three risk categories differed among schools. Contains 30 references. (SV)

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Factors associated with early risk for school-aged children living in rural poverty[1]

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Abstract

Although a main predictor of severity of negative outcomes during adolescence is early onset (Donnermeyer, 1992; Stevens, Youells, Whaley, & Linsey, 1995), less is known about rural children's involvement in at-risk behaviors, or those who may be at risk for not developing positive feelings of worth. This study explores three risk factors: substance use, delinquency and depression, as well as variables that distinguish between individuals at-risk from those who are not.

Different variables were related to each outcome, as autonomy, peer attachment and low grades were related to substance use, while poverty, being male, and depression were linked to delinquency. Depression was associated with low identity development, autonomy from parents, high pubertal status, grades, and dissatisfaction with appearance. Although gender differences were only present for delinquency, different variables discriminated between individuals engaged in the risk factors for boys and girls: external factors such as poverty, autonomy from parents and delinquency were more associated with boys, while more internal factors, such as satisfaction with appearance and identity development were more associated with risk for girls.

Overview

Although many have focused on the high risk environment facing urban teens, they are not the only adolescents living in challenging contexts. Rural youth are engaged in substance use and delinquent activity at rates similar to or higher than urban teens (Donnermeyer, 1992; Stewart, Youells, Whaley, & Linsey, 1995), and often struggle with higher levels of depression; one study found 53% of a sample of rural adolescents as clinically depressed (Stewart et al, 1994).

One main predictor of severity of negative outcomes during adolescence is early age of onset. Several studies have demonstrated that early alcohol use was related to significantly higher levels of use later in adolescence (Newcomb, Maddahian, & Bentler, 1986; Barnes & Welte, 1986); others found an increased risk for later substance use problems when onset began before age 12 (Beauvais and LaBoeff, 1985; Okwumabua and Duryea, 1987). Individuals who engaged in early delinquent activity have also been found to follow a different course than those who began later in adolescence, committing more serious crimes, as well as more chronic delinquency (Farrington, 1987).

Despite links between early risk behaviors and later problems, less is known about rural children's involvement with at-risk behaviors, or which children develop positive feelings of worth. This study explores three risk factors: substance use, delinquency and depression, examining factors distinguishing between individuals at-risk from those who are not.

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Substance use

Webb, Baer and McKelvey (1994), in a study of 272 primarily Caucasian 5th and graders, found that for 5th graders, the biggest predictors or intention to use alcohol was reported influence of older peers. Parental attitudes about alcohol and sensation seeking were also significant. For sixth graders, attitudes about alcohol were the most significant predictor, followed by influence of older peers, tolerance of deviance, and rejection of parental authority. The authors suggested that family factors may not play as much of a role as peer factors in substance use issues as children get older. Peer influence was the most predictive variable in determining levels of drug use in a study 1004 8th and 10th grade rural students (Pruitt et al, 1991), especially their perceptions of how often their friends use drugs.

Long and Boik (1993), in a study of 409 3rd and 4th grade rural children who were followed through 6th and 7th grade, as well as 371 additional rural 6th and 7th graders, found that children's beliefs about alcohol, low self-esteem, negative school attitudes in third and fourth grades were significantly related to use of alcohol in 6th and 7th grades. Girls were slightly less likely to use alcohol (54%) than boys (61%).

Farrell, Anchors, Danish, Howard (1992), in a study of 235 rural 7th graders, found that attitudes towards drug use, delinquency, and lack of expectation to graduate predicted drug and alcohol use. Boys were significantly more likely to use alcohol or smoke cigarettes than girls, but were not significantly more likely to use other illicit drugs.

These studies indicate that many variables impact the decision to use drugs and alcohol, and that family factors by themselves may not be the most influential.

Delinquency

Juvenile delinquency rates are rising faster in rural areas than in urban ones, one study found that half of a rural sample of teens had committed acts of vandalism or another type of property crime (Helge, 1990). She argued that "[t]he image of rural children living wholesome, trouble-free lives compared with youth in more crowd settings [is] in need of revision" (p. 3).

Dubrow and Ippolito, 1994, in a longitudinal study of 473 children followed from 5 to 9 years of age, found that number of years living in poverty predicted antisocial behavior, as chronic poverty remained a significant predictor, even when the presence of father and maternal education were controlled for.

Webster-Stratton (1996), in a study of 222 4-7 year old children and their parents, did not find significant gender differences between boys and girls, as both were observed to have similar levels of externalizing symptoms and verbal deviance. Girls with identified conduct problems, however, were more disparate from non-problem girls than boys were. This suggests that although delinquency is more common for boys during adolescence (Henggeler, 1989(, early signs of deviance may be more similar for boys and girls.

Hoge, Andrews, and Leschied, 1996, in a study of 338 youth between the ages of 12 - 17, found that family relations and parental monitoring were significantly related to youth re-offending and compliance to probation officers. For the younger offenders (12-14) none of the examined protective factors (peer relations, grades, respect for authority, or effective use of leisure time) were related to less delinquent re-offending, but peer relationships and effective use of leisure time were protective for older adolescents.

Depression

Depression in a serious problem facing many rural communities. Many changes in rural life have been argued to account for the increase in depression, such as a greater increase in two income families, and consequently, latchkey children. Churches are no longer the center of community life, and since many individuals are having to travel considerable miles to work, this leaves less time for close-knit communities. (National Mental Health Association, 1988). Beeson and Johnson (1987) found that rural Americans went from being the least psychologically distressed in 1981 to the most distressed in 1986. This corresponded to farmland values peaking and plummeting during those years.

Garfinckel and Hoberman (1986) found in a study of 4300 in three rural communities that teenage suicide in rural areas is 15 times higher than the national average. They found 34% of their adolescent sample reporting being depressed in the last three months. On average these teens reported higher levels of depression than a group of New York adolescents who were hospitalized for depression, although they were living at home and receiving no treatment.

Although all three risk factors are unfortunately common, less is known about which factors are associated with early involvement. The purpose of this study is to examine factors that distinguish between individuals engaging in early substance use, delinquent behavior and those with high levels of depression from those who are not. It also seeks to explore gender differences in the three risk behaviors, in terms of incidence, as well as the variables that discriminate between those engaged in the risk behavior, and those who are not.

Method

Participants

Two counties in the midwest with high concentrations of child poverty (29% and 31% below federal poverty lines) were selected to participate. Six school systems (grade enrollment ranging from 7 to 45) took part, resulting in a sample of 162 predominately Caucasian 5th and 6th graders. All parents of the fifth and sixth grade students were mailed letters informing them of the study and asking for permission to allow their children to participate. Of the 200 students, 175 parents (88%) granted permission. Of the 162 participants who took part, 89 were male and 71 were female (one student had missing data for this item), with a mean age of 11.1.

Measures

In a survey, levels of delinquency (Elliott, Huizinga & Ageton, 1985), substance use (Selnow, 1987) and depression (Comstock & Helsing, 1976) were assessed, as well as variables hypothesized to relate to these risk and protective factors: identity development, pubertal status, perceptions of hunger, economic hardship, peer attachment, autonomy, perceived parental treatment, loneliness, number of extracurricular activities, satisfaction with appearance, and grades, using well established measures.

Substance use. The Substance Usage Index (Selnow, 1987) indicates the frequency of drug and alcohol use, as measured by self-report. It consists of five questions which ask, "Which of the following describes how often you smoke marijuana?, alcohol?, beer? wine?, or other drugs?" This format is beneficial in that it reveals a range of behaviors as well as depth of those behaviors. There are six responses ranging from "never use" to "use substance every day." Internal consistency for this scale was .77.

Delinquency. Elliott, Huizinga, & Ageton's (1985) Self-report Delinquency scale indicates frequencies of several types of delinquency, and nine items were taken from this scale. The original scale consists of 24 items which examine frequency of minor delinquent acts, as well as more serious types of delinquent behavior. Responses are scored as the number of times the adolescent has engaged in an activity in the last six months. The nine-item modified version used in this study had an internal consistency of .76

Depression. Nine items from the Center of Epidemiologic Studies (CES-D) scale were used to measure levels of depression. The original measure consists of 20 four-point Likert-type questions, with responses ranging from "rarely or none of the time" to "most or all of the time." Sample items are "I thought my life had been a failure" and "I had crying spells." Several items pertained to issues not common to elementary children, such as a loss in sexual interest, thus nine items were selected, with a Cronbach's alpha of .88.

Peer attachment was measured with a 10-item scale, modified from a 25 item scale: the inventory of parent and peer attachment, developed by Armsden and Greenberg (1987). This scale was the Inventory of Adolescent Attachment, developed in 1984 by Greenberg. It assesses the extent that subjects trust their peers understand, support and respect them and their feelings. A sample question is "My friends accept me as I am." Cronbach

alpha of the three subscales of the IPPA ranged from .72 to .91, and was .85 for the subscale used in the current study.

Autonomy was assessed with a 14 item scale, modified from a scale developed by Steinberg & Silverberg (1986), designed to measure emotional autonomy in adolescents. This scale measures four components of emotional autonomy (perceives parents as people, parental deidealization, non-dependency on parents and individuation). For purposes of this study, the subscale of perceiving parents as people was deleted. A sample question is "It's better for kids to go to their best friend than to their parents for advice on some things." Cronbach's alpha for the scale was .75 in the original study, and .83 in this study.

Perceptions of hunger was measured with a 5 item scale developed by Wehler (1987) for the Community Childhood Hunger Identification Project, conducted by the Food and Research Action Center. A sample item is "I am often hungry, but I don't eat because we can't afford to buy food." Cronbach's alpha for this scale was .71.

Pubertal development. The somatic manifestations of puberty were targeted in the Pubertal Development Scale developed by Petersen, Crockett, Richards and Boxer (1988). It consists of 5 items for each gender with 4 response categories ranging from no development to complete development. A sample item for boys is "facial hair". This scale demonstrated a Cronbach's alpha of .54 in our study.

Economic deprivation was assessed with a 11-item scale based on a scale developed by Lempers, Clark-Lempers, & Simons (1989). This scale, for use with early adolescents, measures changes in current and past levels of income, and ability to pay bills and meet basic needs. These questions are advantageous in that many children are not aware of the exact amount of their family's finances, but are aware of parental behaviors concerning finances. A sample item is, "During the last six months, how often did your family sell some possessions?" Cronbach alphas for this scale was .86 for a rural teen population in a validation study, and .72 in the current study.

Perceived parental treatment. Perceptions of parental treatment were assessed with a 16-item scale modified by Lempers, Clark-Lempers, & Simons (1989). This scale used items from Schaefer's (1965) Child Report of Parental Behavior Inventory, and from Roberts, Block, & Block's (1984) Child Rearing Practices Report. Three components of parental treatment are tapped: parental discipline, affection, and communication; all of which have been found to be strong predictors of delinquency and drug use. Sample items include, "My parents want to know exactly where I am and what I am doing," and "My parents try to understand how I see things." Four possible responses are offered for each item: never, sometimes, often, and very often. The internal consistency was .72.

Identity. The identity subscale of the Erikson Psychosocial Stage Inventory (Rosenthal, Gurney, & Moore, 1981) was used. This 8-item scale is part of a larger measure examining each of Erikson's (1963) psycho-social stages of development. High scores on the identity scale express a clear sense of beliefs and personal goals, and confidence in achieving these goals. There are twelve questions for ego-identity (sample question: "I have a clear idea of what I want to be") with a Cronbach alpha of .72.

Grades were measured by grade-point average, indicated by self-report. Students were also asked whether they received "mostly A's; mostly B's" etc., in the last grading period.

Loneliness was ascertained with ten items taken from Asher, Hymel, and Renshaw's (1984) 14-item scale, which examines feelings of social dissatisfaction and personal perceptions of peer status. Sample items include, "I can find a friend when I need to," and "I feel left out of things." Respondents pick from one of five choices ranging from always true to not true at all. Internal consistency for this scale was .89.

Number of extracurricular activities was assessed by summing the responses of checking off certain after school activities they were involved in , as well as listing other activities that were not on the provided list.

Results

T-test analyses were performed to determine differences in both gender and year in school. Differences present for gender were that girls were more advanced in pubertal development ($t(152)=-2.58$, $p < .01$) and reported lower levels of self-esteem ($t(155)=1.97$, $p < .05$) and delinquency ($t(156)=2.98$, $p < .01$). No differences were present between 5th and 6th graders, except for expected results that sixth graders were older ($t(156)=-12.39$, $p < .001$), and more advanced in pubertal development ($t(152)=-4.38$, $p < .001$).

A series of one-way analyses of variance were conducted to determine differences among variables within the six schools. Results indicated a main effect difference for the three dependent variables (substance use, delinquency and depression). Post-hoc Scheffé tests revealed that students in School 3 reported significantly higher levels of drug use than all other schools ($F(5,154)=9.71$, $p < .0001$), higher levels of delinquency ($F(5,155)=3.08$, $p < .01$), and depression than two other schools ($F(5,1554)=2.61$, $p < .05$).

In order to examine which variables would distinguish school-aged children at risk from those who were not, three discriminant functions analyses were performed. A step-wise procedure was used, with all variables except the dependent variable entered as independent. First, subjects were grouped according to experimentation with alcohol or drugs, with 15% (n=24) indicating some experimentation. Four significant predictors were identified ($\lambda(4,152) = .84$, $p < .001$, $r_c = .40$): individuals higher in autonomy, delinquency, peer attachment, and with lower grades were more likely to be classified in the substance use group. Accuracy of classification was 72% (See Table 1). Table 2 describes means and standard deviations according to group membership.

Four factors were significant in distinguishing between individuals who had engaged (44%, n=68) or not engaged in delinquency: perceptions of hunger, economic hardship, being male, and depression. The accuracy of classification was 68% ($\lambda(4,149) = .82^{***}$, $r_c = .43$).

For the third analysis, subjects were grouped whether or not they scored high on the CES-D scale of depression, with 16% (n=24) scoring in the highly depressed category. Five significant predictors were identified, with accuracy of classification at 79% ($\lambda(5,147) = .72$, $p < .001$, $r_c = .53$). Individuals higher in identity development, grades, and low in autonomy, loneliness, and pubertal development were significantly less likely to be depressed.

Although no gender differences were present in levels of the three risk behavior variables, different variables were influential in discriminating between at-risk and non at-risk children. Discrimination analyses were again performed separating by gender. (See Table 3 and Table 5 for information on the discriminant function analyses for females). For females, 14% (n=10) indicated some experimentation with alcohol or drugs. Three significant predictors were identified ($\lambda(3,68) = .79$, $p < .001$, $r_c = .44$): individuals higher in pubertal status, number of extracurricular activities, and with lower grades were more likely to be classified in the substance use group. Accuracy of classification was 80%.

Three factors were significant in distinguishing between individuals who had engaged (30%, n=21) or not engaged in delinquency: higher levels of depression, lower levels of identity development and satisfaction with appearance. The accuracy of classification was 71% ($\lambda(3,68) = .75^{***}$ $r_c = .50$).

For the third analysis, 20% (n=14) scored in the highly depressed category. Two significant predictors were identified, with accuracy of classification at 64% ($\lambda(2,69) = .78$, $p < .01$, $r_c = .47$). Individuals higher in loneliness and autonomy were more likely to be depressed.

For males, 17% (n=15) indicated some experimentation with alcohol or drugs. Three significant predictors were identified ($\lambda(3,89) = .81$, $p < 001$, $r_c = .44$): individuals higher in delinquency, autonomy, and economic hardship were more likely to be classified in the substance use group. Accuracy of classification was 67%

Five factors were significant in distinguishing between individuals who had engaged (55%, n=49) or not engaged in delinquency: lower grades, and higher levels of autonomy, perceptions of hunger and economic hardship, and substance use. The accuracy of classification was 61% ($\lambda(5,84) = .75^{***}$ $r_c = .50$).

For the third analysis, 12% (n=11) scored in the high depressed category. Five significant predictors were identified, with accuracy of classification at 85% ($\lambda(52,84) = .64$, $p < .001$, $r_c = .60$). Individuals lower in identity development and grades, and higher in perceptions of hunger, loneliness, and autonomy, were more likely to be depressed.

Discussion

Findings indicate that a substantial subset of these rural school-aged children is experimenting with drugs, alcohol, delinquency, or struggling with depression. Even though all three risk behaviors were correlated, different variables were related to each risk behavior. Poverty, being male and depression played a greater role in delinquent behavior. Separating from parents and doing poorly in school, as well as movements towards deviant behavior and peer attachment was associated with substance use. Several factors related to levels of depression, such as identity development, pubertal status, satisfaction with appearance, autonomy, grades and poverty.

Boys and girls, while they did not differ in *incidence* of substance use or depression (although boys were more likely to be delinquent), did differ in which variables discriminated between those who were likely to possess the risk factor and those who were not. Economic hardship and perceptions of hunger were related to all three risk behaviors for boys, but none for girls. It is therefore important to examine whether poverty continues to remain more stressful for boys than girls as they move towards adolescence. For girls, all three risk factors were discriminated by completely different factors, indicating that variables predicting early substance use may not be useful in predicting depression or delinquent behavior. Internal variables such as identity development, and satisfaction with appearance were more predictive of negative risk behaviors for girls.

It was interesting to note that even though all tested school districts were within 30 miles of each other, differences existed within the individual communities, even in a homogeneous rural context. One school engaged in significantly higher levels of all three risk behaviors. This finding suggests the importance of examining individual community factors, and not assuming that contexts that are similar in for example, population and rurality, will offer children and adolescents the same set of risk and protective factors.

It is also noteworthy that autonomy, while often a desirable outcome during adolescence, posed a significant risk factor in late childhood, as it distinguished between likelihood of substance use or depression for the total sample, and delinquency for boys. Similar to the results found by Webb, Baer and McKelvey (1994), perceptions about the parental relationship were not significant predictors of either substance use or delinquency, although relationships between friends and grades were. Again it will be important to assess whether the parental relationship becomes more important during adolescence.

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Table 1 *Accuracy of prediction in discriminant function analyses for the total sample*

		Grouped Predictor Variables				
Prediction Variables	N	N	%	N	%	Overall Accuracy
		Non-substance users		*Substance users*		
Non-Substance Users	135	100	74%	35	26%	
Substance Users	24	9	38%	15	63%	72%
		Non-delinquents		*Delinquents*		
Non- Delinquents	90	57	64%	33	37%	
Delinquents	69	18	26%	51	74%	68%
		Low depression		*High depression*		
Low Depression	136	108	79%	28	21%	
High Depression	25	6	24%	19	76%	79%

Table 2 *Means and standard deviations of significant predictor variables according to group membership for the total sample*

Significant Prediction	Wilke's λ	Mean	SD	Mean	SD
$\lambda(4,152) = .84^{***}$ $r_c = .40$		*Non-Substance Users*		*Substance Users*	
Autonomy	.93	26.41	(8.2)	32.43	(6.3)
Delinquency	.89	0.84	(1.4)	1.95	(2.4)
Peer attachment	.86	36.69	(8.8)	40.17	(6.6)
Grades	.84	4.42	(0.6)	4.13	(0.7)
$\lambda(4,149) = .82^{***}$ $r_c = .43$		*Non-Delinquents*		*Delinquent Exp.*	
Perceptions of hunger	.94	4.20	(0.8)	4.72	(1.3)
Gender	.86	1.56	(0.5)	1.30	(0.5)
Depression	.84	12.53	(3.3)	14.72	(5.5)
Economic hardship	.82	16.62	(5.2)	17.11	(5.6)
$\lambda(5,147) = .72^{***}$ $r_c = .53$		*Low Depression*		*High Depression*	
Loneliness	.85	15.14	(5.9)	22.46	(8.5)-
Identity	.81	32.13	(5.2)	26.70	(3.7)
Autonomy	.77	26.45	(8.1)	31.92	(7.6)
Grades	.73	4.44	(0.6)	4.00	(0.7)
Pubertal status	.72	3.96	(2.6)	5.29	(3.0)

Table 3 *Accuracy of prediction in discriminant function analyses for females*

Prediction Variables	N	Grouped Predictor Variables N	%	N	%	Overall Accuracy
		Non-substance users		*Substance users*		
Non-Substance Users	61	49	80%	12	20%	
Substance Users	10	2	20%	8	80%	80%
		Non-delinquents		*Delinquents*		
Non- Delinquents	50	36	72%	14	28%	
Delinquents	21	6	29%	15	71%	71%
		Low depression		*High depression*		
Low Depression	57	43	75%	14	25%	
High Depression	14	5	36%	9	64%	64%

Table 4 *Accuracy of prediction in discriminant function analyses for males*

Prediction Variables	N	Grouped Predictor Variables N	%	N	%	Overall Accuracy
		Non-substance users		*Substance users*		
Non-Substance Users	74	59	80%	15	20%	
Substance Users	15	5	33%	10	67%	67%
		Non-delinquents		*Delinquents*		
Non- Delinquents	40	29	73%	11	28%	
Delinquents	49	19	39%	30	61%	61%
		Low depression		*High depression*		
Low Depression	78	67	86%	11	14%	
High Depression	11	2	18%	9	82%	85%

Table 5 *Means and standard deviations of significant predictor variables according to group membership for females*

Significant Prediction	Wilke's λ	Mean	SD	Mean	SD
$\lambda(3, 68) = .79^{***}$ $r_c = .45$		*Non-Substance Users*		*Substance Users*	
Pubertal development	.93	4.47	(2.3)	6.20	(1.9)
Number of extra-curricular activities	.85	3.24	(1.6)	4.50	(1.8)
Grades	.79	4.53	(0.7)	4.20	(0.8)
$\lambda(3, 68) = .75^{***}$ $r_c = .50$		*Non-Delinquents*		*Delinquent Exp.*	
Depression	.87	12.98	(3.8)	16.81	(6.3)
Identity development	.82	31.94	(5.4)	27.81	(4.7)
Satisfaction with appearance	.75	11.38	(2.5)	12.00	(2.9)
$\lambda(2, 69) = .78^{**}$ $r_c = .47$		*Low Depression*		*High Depression*	
Loneliness	.84	15.02	(5.7)	22.14	(9.6)
Autonomy	.78	26.13	(5.7)	31.71	(9.4)

Table 6 *Means and standard deviations of significant predictor variables according to group membership for males*

Significant Prediction	Wilke's λ	Mean	SD	Mean	SD
*λ(3, 86) = .81*** r_c = .44*		*Non-Substance Users*		*Substance Users*	
Delinquency	.87	1.15	(1.7)	3.08	(2.6)
Autonomy	.84	26.25	(9.4)	33.69	(5.2)
Economic hardship	.81	16.30	(4.8)	19.00	(5.8)
*λ(5, 84) = .75*** r_c = .50*		*Non-Delinquents*		*Delinquent Exp.*	
Grades	.93	4.46	(0.6)	4.13	(0.6)
Autonomy	.86	24.90	(10.8)	29.43	(7.2)
Perception of hunger	.83	4.10	(0.7)	4.55	(1.1)
Economic hardship	.79	16.79	(5.0)	16.64	(5.1)
Substance use	.75	0.95	(1.4)	2.09	(3.1)
*λ(5, 84) = .64*** r_c = .60*		*Low Depression*		*High Depression*	
Identity development	.82	32.67	(4.9)	25.70	(3.9)
Perceptions of hunger	.76	4.24	(0.7)	5.20	(1.6)
Grades	.71	4.36	(0.6)	3.70	(0.5)
Loneliness	.66	14.96	(5.7)	22.90	(7.1)
Autonomy	.64	26.74	(9.5)	32.20	(4.4)